GX55 SIMULATOR GENERAL SET UP
FOR SEARCH PATTERNS FROM TRENTON, NJ

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Model: GX55

Options: (*This is for simulator only*.)

IFR: off (no check mark)
APPR: off (no check mark)
SAR: on (check mark)(will stay on until turned off)
Nav Database: (Americas.bin)(need to click on to see)(will stay until changed)
Reset Present Position: on (check mark)(set every time the GPS is turned on)
Run Internal Simulator: off (no check mark)(off for operator control of TRACK)

Turn on GPS simulator by clicking on ON-OFF key (upper right side), and wait for:

RESET
PRESENT POSITION
PRESS SELECT

Click on SELECT key. *Above and this is for simulator only*.

PPos : 40 deg 16.60 N
: 074 deg 48.8 W
RefWpt : Chg? (flashing)

If the displayed coordinates are exactly as the above sample coordinates, click on the NAV key. The simulator's present position is TTN, Trenton Airport. Otherwise, **click on ENTER key, then change airport to TTN using the instructions below.** *This is for simulator only*.

AIRPORT (*flashing*) AAF
APALCHICOLO
City FL USA

To change AAF to TTN, get the first A of AAF to flash by turning outside knob one click clockwise and turning inner knob clockwise until T appears. The two concentric knobs are located lower right on GPS. To turn outer knob, place cursor on outer edge of outer knob. To turn the center knob, place the cursor on the center of the center knob. To turn either knob Counter Clockwise, click the left mouse button. To turn either knob clockwise, click the right mouse. If you overshoot, turn knob opposite direction. Then turn outer knob another click clockwise to get the second letter to flash, and then turn inner knob clockwise to T. Then turn outer knob another click clockwise to get the third letter to flash, and then turn inner knob clockwise to N. Click on ENTER to cancel the earlier SELECT.

PPos : 40 deg 16.16 N (4 of 43 is flashing)
: 074 deg 48.81 W
RefWpt : TTN

Click on ENTER again to accept Trenton Airport as current position.

Then Clear Active Flight Plan Page will appear:

Clear Active
Flight Plan
YES or NO (flashing) (YES is preferred.) (Change with inner knob.)

Click on the ENTER key. Will advance to next screen if click on ENTER is delayed.

Then Database page will appear:

Americas DB (Cannot set present position to TTN if International DB)
Expires 02/23/00 (flashes)
Press ENTER

After clicking ENTER, the default NAV page will appear:

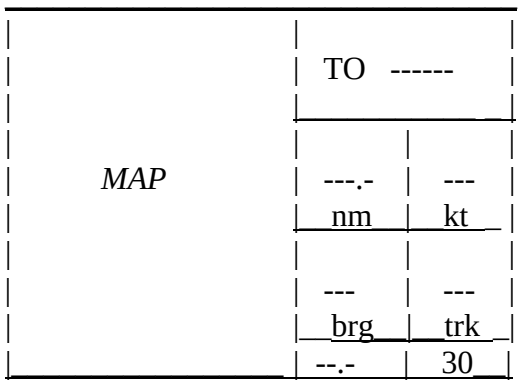
ETE ---- --:--
-- NAV Flagged --
Brg --- --.-nm-

Turn outer knob one click counter clockwise to FROM – TO – NEXT page:

FROM ------
TO ------
NEXT ------

The above step is done now to reduce the number of steps to put GPS waypoint sequencing on hold later. For IFR approach models GX50 and GX60, the above step may be omitted, because these models have HOLD keys on the aircraft instrument panel.

Click on MAP key:



If KT is not zero (---), use down arrow to zero ground speed, and then turn off and turn on the GPS. Then go back to beginning, Options, click on Reset Present Position, and follow the instructions from "Turn on the GPS simulator".

If the groundspeed (KT) was not zeroed before the simulator was shut down the last time, the simulator will move away from the present position before the GPS simulator can be set up for a search pattern. This is for simulator only and very important; otherwise, you will not be departing Trenton Airport and the airspeed will speed up auto sequencing. Auto sequencing will be too fast to stop before reaching waypoint 9.

WHEN THE DISPLAY IS IN MAP MODE, OUTER KNOB CONTROLS MAP PAGE, AND INNER KNOB CHANGES MAP SCALE.

Turn outer knob one click counter clockwise to get the first MAP set up page.

Route Line : YES
Map Orient : TRACK
Map Ref : PLANE

THE DIAMOND ON LOWER RIGHT MEANS THAT SET UPS ARE ON MULTIPLE PAGES, THAT CAN BE REACHED WITH THE INNER KNOB IN EITHER DIRECTION.

Turn inside knob one click (two clicks for GX50s & GX60s) counter clockwise to get the last MAP set up page.

SAR Map : ON
Grid Type : US
Position : SEA (Seattle Sectional)

Click on SEL key:

SAR Map : ON (flashes)(must remain ON)
Grid Type : US
Position : SEA (Seattle Sectional)

Turn outer knob 1 click counter clockwise:

SAR Map : ON
Grid Type : US
Position : SEA (Seattle Sectional) (flashes)

Turn inner knob 14 clicks clockwise until NYC appears:

SAR Map : ON
Grid Type : US
Position : NYC (New York City Sectional) (flashes)

Click on ENTER key to activate New York City Sectional:

SAR Map : ON
Grid Type : US
Position : NYC (New York City Sectional)

The simulator will always go back to the Seattle Sectional when turned off. The GPS in the aircraft will stay with the last sectional when turned off.

Turn outer knob one click counter clockwise:

------ (waypoint) --- (bearing)

MAP

30 (scale) ---.- (distance)

PAT soft key

THIS IS THE COMMON JUMP OFF POINT FOR ALL SEARCH PATTERNS:

GPS TERMS

HEADING:

Magnetic direction the aircraft is pointed. Same as TRACK in zero cross wind.

BEARING (to waypoint):

The magnetic course from current position to desired waypoint.

DISTANCE (to waypoint):

Distance current position to desired waypoint.

TRACK:

Actual magnetic direction the aircraft is flying over the ground.

DESIRED TRACK (DTK):

Desired course or path to desired waypoint.

CROSS TRACK ERROR:

The number of nm the aircraft is left or right of DTK.

US GRID DESIGNATIONS:

Sectional: e.g. SEA = Seattle, NYC = New York, MON, Montreal
JAX = Jacksonville, MIA = Miami

Grid Number: Starting with 1 in the upper left hand corner and ending in the lower corner of the given sectional. Each grid is15 min square.

Quadrant: Each grid is sub divided into four quadrants: A, B, C, and D
The quadrants are: A = northwest, B = northeast,
C = southwest, D = southeast

Start Corner (GX50, GX55, GX60 GPSs only):
1 = northwest, 2 = northeast, 3 = southeast, 4 = southwest

e.g. NYC 457D4 New York City grid 457D (start southwest corner)
NYC 457D1 (start northwest corner)

N-S: north-south tracks starting either north or south.
E-W: east-west tracks starting either east or west

PARALLEL SEARCH PATTERN FROM TRENTON NJ STARTING CORNER WILL NOT CAUSE AUTO SEQUENCING

Perform **GX55 SIMULATOR GENERAL SET UP** first and then skip to Parallel Line (flashing) screen.

RESTART HERE; SHOULD WAYPOINT AUTO SEQUENCE BEYOND 9:

You should have this map page to start:

------ (waypoint) --- (bearing)

MAP

30 (scale) ---.- (distance)

PAT soft key

Click on the PAT soft key and the Parallel Line Search Pattern page will appear.

Parallel Line (flashing)
Search Pattern
Press ENTER

Click on ENTER key to get the Parallel Line Search Pattern set up page, and then **click on the SEL key.** Grid NYC 457B1 is the grid that the airport TTN is in.

Grid (US) : 457D1 (First character position flashes.)
Spacing : 0.5
Direction : N/S

Click on SEL, and the (4 of 457D1) will flash. The outer knob controls character position, and the inner knob changes the character**. Using outer and inner knobs change (457D1) to 457B4.** Starts on the southwest corner of a grid north of TTN. We want half nm spacing, and in this case E/W tracks; therefore, turn outer knob clockwise until N/S flashes. Turn inner knob one click either direction until E/W flashes, click on ENTER only once to cancel SEL and stop E/W flashing.

Grid (US) : 457B4
Spacing : 0.5
Direction : E/W (flashes)

Then click on ENTER key again to activate search pattern.

Then the map page with the PAT soft key reappears:

1 (waypoint)	037(bearing)
MAP	
30 (scale)	6.66 (distance)

PUT THE GPS OR GPS SIMULATOR IN HOLD:

To prevent auto sequencing while maneuvering onto the 1st search leg defined by waypoint 0 and waypoint 1. This is a precaution. Auto sequencing will not occur in this situation, if you fly TTN direct to just south of waypoint 0, and track 103 degrees with zero cross track error toward waypoint 1. Putting the GPS into hold in the next situation will not be an option, and it will have to be done without delay.

Click on NAV Key: (Only once, second click will get nav home page.)

Should be on FROM TO NEXT page: (If not, rotate outer knob.)

FROM	0
TO	1
NEXT	2

Click on SELECT key:

FROM	0
TO	1
NEXT	CHG? (flashes)

Rotate outer knob two clicks counter clockwise to get TO to change to HOLD and flash:

FROM	0
HOLD? (flashes)	1
NEXT	2

Click on ENTER key to activate the HOLD:

FROM	0
HOLD	1
NEXT	2

While the aircraft or simulator is at TTN with zero airspeed, the GPS or GPS simulator will not auto sequence to waypoint 29(Grid 457B4). This is why we are making sure we are at TTN with zero airspeed before activating the search pattern flight plan.

Click on MAP key.

1 (waypoint) 037 (bearing)

MAP

30 (scale) 6.66 (distance)

Click on MAP key again: (Second click on MAP key goes direct to map page below.)

	TO 1	
MAP	6.66 nm	--- kt
	037 brg	--- trk
	<6.11	30

^ cross-track error: 6.11 nm right of the 0 to 1 leg

Cross track error can equal the distance to the waypoint, but will never be greater.

Determine approximate TRACK to waypoint 0 using the New York sectional chart. A track of approximately 350 deg will cross waypoint 0.

With up arrow get the simulated aircraft taxing 5 knots. Then use the left arrow to set the TRACK to 350 deg.

FROM THIS POINT ON, REDUCE AIRSPEED TO ZERO WITH THE DOWN ARROW, BEFORE TURNING OFF SIMULATOR. THE SIMULATOR WILL RETURN WITH THE SAME AIRSPEED AND TRACK AT PREVIOUS SHUT DOWN ON NEXT TURN-ON.

Then with the up arrow increase your airspeed to cruise. Use the inner knob to control MAP scale. Reduce MAP scale as you approach waypoint 0. At waypoint 0 your MAP scale should be down to 5 or 2 nm. As you approach waypoint 0 reduce airspeed to 90 knots. As the cross track error is approaching 1 nm track 283 deg. When 5.0 nm from waypoint start 150 deg turn toward leg 1 defined by waypoints 0 and 1.

Increase TRACK to 103 deg as the cross track error goes to zero. When following leg 1, take the GPS out of hold before reaching waypoint 1. Suggest doing it before reaching 2 nm to waypoint 1. If you don't; waypoint 1 will not sequence to waypoint 2.

Click on NAV key. The FROM-HOLD-NEXT page should come up:

FROM	0
HOLD	1
NEXT	2

Click on the SEL key:

FROM	0
HOLD	1
NEXT	Chg?

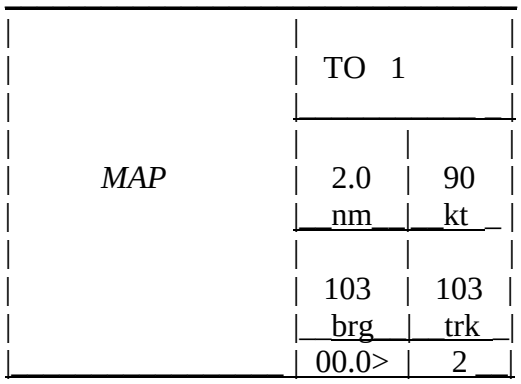
Turn outer knob 2 clicks counter clockwise:

FROM	0
TO?	1
NEXT	2

Click on ENTER key:

FROM	0
TO	1
NEXT	2

Click on MAP key:



FLY THE GRID AS MUCH AS YOU NEED, USING THE RIGHT AND LEFT ARROWS.

REMINDER: DOWN ARROW AIRSPEED TO ZERO (---) BEFORE TURNING OFF GPS SIMULATOR.

PARALLEL SEARCH PATTERN FROM TRENTON NJ
STARTING CORNER WILL CAUSE AUTO SEQUENCING

Perform **GX55 SIMULATOR GENERAL SET UP** first and then skip to Parallel Line (flashing) screen.

RESTART HERE; SHOULD WAYPOINT AUTO SEQUENCE BEYOND 9:

You should have this map page to start:

------ (waypoint) --- (bearing)

MAP

30 (scale) ---.- (distance)

PAT soft key

Click on the PAT soft key and the Parallel Line Search Pattern page will appear.

Parallel Line (flashing)
Search Pattern
Press ENTER

Click on ENTER key to get the Parallel Line Search Pattern set up page, and then click on the SEL key. Grid NYC 457B1 is the grid that the airport CON is in.

Grid (US) : 457D1 (First character position flashes.)
Spacing : 0.5
Direction : N/S

Click on SEL, and the (4 of 457D1) will flash. The outer knob controls character position, and the inner knob changes the character**. Using outer and inner knobs change (457D1) to 457B1**. Starts on the southwest corner of a grid north of TTN. We want half nm spacing, and in this case E/W tracks; therefore, turn outer knob clockwise until N/S flashes. Turn inner knob one click either direction until E/W flashes, click on ENTER only once to cancel SE L and stop E/W flashing.

Grid (US) : 457B1
Spacing : 0.5
Direction : E/W (flashes)

Read ahead to "END OF READ AHEAD POINT;" before executing next instruction. These instructions must be executed rapidly.

Then click on ENTER key again to activate search pattern.

Then the map page with the PAT soft key reappears:

1 (waypoint)	025(bearing)
MAP	
30 (scale)	13.5 (distance)

PUT THE GPS OR GPS SIMULATOR IN HOLD:

Click on NAV Key: (Only once, second click will get nav home page.)

Should be on FROM TO NEXT page: (If not, rotate outer knob.)

FROM	0-------→8----------→28
TO	1-------→9----------→29
NEXT	2-------→10----------→

Click on SELECT key:

FROM	0--------→8----------→28
TO	1--------→9----------→29
NEXT	CHG? (flashes)

Rotate outer knob two clicks counter clockwise to get TO to change to HOLD and flash:

FROM	0--------→8----------→28
HOLD? (flashes)	1--------→9----------→29
NEXT	2--------→10----------→

Click on ENTER key to activate the HOLD:

FROM	0--------→8----------→28
HOLD	1--------→9----------→29
NEXT	2--------→10----------→

While the aircraft or simulator is at TTN with zero airspeed, the GPS or GPS simulator should auto sequence to waypoint 29(Grid457B1) slow enough to get GPS in hold by waypoint 9. This is why we are making sure we are at TTN with zero airspeed before activating the search pattern flight plan. Auto sequencing to waypoint 10 or higher, the first leg "0 to 1" will have been over written. The flight plan memory can only hold 20 legs, 21 legs are required for N-S tracks, and 29

legs are required for E-W tracks. If the search pattern is activated in a position that causes waypoint auto sequencing, the GPS must be put in HOLD without delay.

END OF READ AHEAD POINT; EXECUTE ABOVE INSTRUCTIONS RAPIDLY.

NOTE: The flight plan has already auto sequenced past waypoint 1 to higher waypoint. The waypoint number is dependent on how fast the GPS was put into hold. The northwest corner of New York City grid 457B (457B1) was chosen to demonstrate auto sequencing. Had the southwest corner of New York City grid 457B (457B4) been chosen, auto sequencing would not occur. Auto sequencing occurs when the GPS unit has determined it has passed the intended waypoint. This feature is necessary for normal flight plans, because air traffic control may have you on radar vectors bypassing a flight plan waypoint. The GPS automatically senses you have bypassed a waypoint and auto sequences to the nearest flight plan waypoint ahead in the flight plan. The HOLD function prevents auto sequencing. New York City 457B1 has waypoint 1 farther from TTN than waypoint 2 causing the GPS to determine that waypoint has been bypassed. New York 457B4 has waypoint 2 farther from waypoint 1 causing the GPS to determine waypoint 1 has <u>not</u> been bypassed.

If HOLD is activated on waypoint 10 or greater, click MAP key and click on PAT soft key to cancel search pattern. Waypoint 0 to waypoint 1 leg has been lost. Repeat from beginning of this section again.

Click on the FPL soft key:

8	TO 9 (This is the highest recoverable leg.)
9** 103 deg	5.3 nm
---	---

Click again on the FPL soft key:

* Active *	58 nm (distance from waypoint 0 and 20)
Dest Wpt	20
Holding	

Turn inner knob one click counter clockwise until the leg " 0 to 1" is displayed:

0	TO 1
1* 103 deg	5.3 nm
---	---

Click on ENTER key to force flight plan back to the 0 to 1 leg:

0 TO 1
Press ENTER
To Activate Leg

Click on ENTER:

FROM 0
HOLD 1
NEXT 2

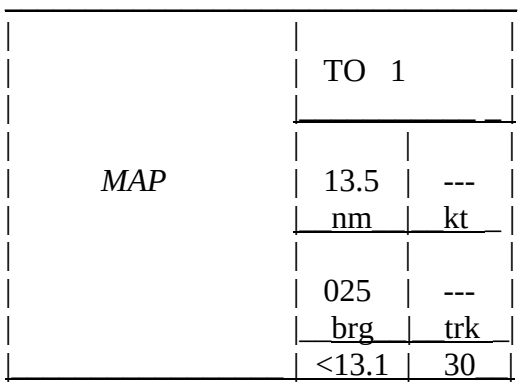
Click on MAP.

1 (waypoint) 025 (bearing)

MAP

30 (scale) 13.5 (distance)

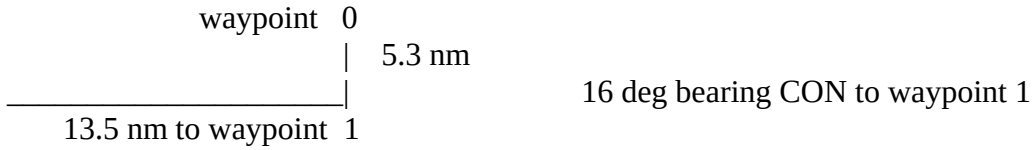
Click on MAP key again: (Second click on MAP key goes direct to map page below.)



^ cross-track error: 13.1 nm right of the 0 to 1 leg

Cross track error can equal the distance to the waypoint, but will never be greater.

Determine approximate TRACK to waypoint 0 using the New York sectional chart or:



Approximate TRACK = 25deg – approx ((5.3nm / 13.5nm) x (60deg))
= (25 – approx 23deg) = approx 002 deg {002 deg exact}

With up arrow get the simulated aircraft taxing 5 knots. Then use the left arrow to set the TRACK to 002 deg, the approximate value, or 002 deg, the exact value.

FROM THIS POINT ON, REDUCE AIRSPEED TO ZERO WITH THE DOWN ARROW, BEFORE TURNING OFF SIMULATOR. THE SIMULATOR WILL RETURN WITH THE SAME AIRSPEED AND TRACK AT PREVIOUS SHUT DOWN ON NEXT TURN-ON.

Then with the up arrow increase your airspeed to cruise. Use the inner knob to control MAP scale. Reduce MAP scale as you approach waypoint 0. At waypoint 0 your MAP scale should be down to 5 or 2 nm. As you approach waypoint 0 reduce airspeed to 90 knots. When approaching western edge of grid follow the western edge tracking 284 deg. When cross track error reduces to 0.5 nm, start 60 deg turn toward leg 1 defined by waypoints 0 and 1. Increase TRACK to 103 deg as the cross track error goes to zero. When following leg 1, take the GPS out of hold. If you don't; waypoint 1 will not sequence to waypoint 2.

Click on NAV key. The FROM-HOLD-NEXT page should come up:

FROM	0
HOLD	1
NEXT	2

Click on the SEL key:

FROM	0
HOLD	1
NEXT	Chg?

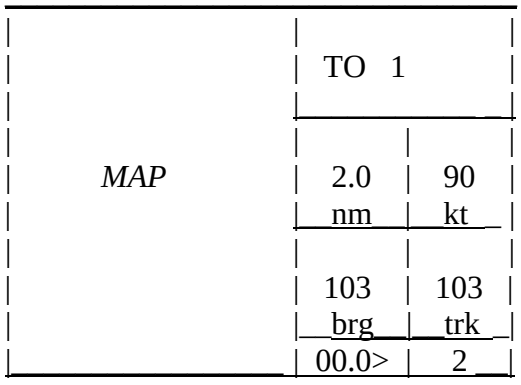
Turn outer knob 2 clicks counter clockwise:

FROM	0
TO?	1
NEXT	2

Click on ENTER key:

FROM	0
TO	1
NEXT	2

Click on MAP key:



FLY THE GRID AS MUCH AS YOU NEED, USING THE RIGHT AND LEFT ARROWS.

REMINDER: DOWN ARROW AIRSPEED TO ZERO (---) BEFORE TURNING OFF GPS SIMULATOR.